

REMARKS

Favorable reconsideration of this application, in light of the preceding amendments and following remarks, is respectfully requested.

Claims 9-16 are pending in this application. Claims 10-13 and 15-16 are amended and claims 1-8 have been cancelled. Claims 9 and 15 are the independent claims.

Entry of Amendment after Final Requested

Entry of this Amendment After Final is requested in that none of the amendments made herein raise new issues requiring further consideration and/or search, but instead only correct minor grammatical errors.

Claim Objections

Claims 10-16 have been objected to due to informalities and minor draft errors. The minor grammatical corrections requested by the Examiner have been made, except for replacing “on” with –from—, and “exit” with –exited— in claims 12 and 16. Applicants respectfully submit that claims 12 and 16 are grammatically correct in their present form. Therefore, withdrawal of the objection is respectfully requested.

Example Embodiments of the Present Application

Independent claims 9 and 15 recite pore or particle-size distribution measurement methods for measuring size distribution of pores or particles existing within a porous insulator film formed on a surface of a substrate. The method of claim 9 includes irradiating the insulator film with X-rays from the insulator film's surface side at an incident angle which is set to be larger than a total-reflection critical angle of the insulator film but less than 1.3 times a total-reflection critical angle of the substrate. Additionally, the method of claim 9 includes detecting among reflection components reflected on the surface of the substrate of the X-rays which have been emitted from the X-ray generating means and entered the insulator film, reflection components exiting from the insulator film after entering the pore or particle and scattering, having an exit angle larger than that of reflection components which exit from the insulator film without entering the pore or particle. The method of claim 15 includes irradiating X-rays from the insulator film's surface side at an incident angle set to be larger than a total-reflection critical angle of an uppermost surface layer, and a two-dimensional position-sensitive detector for detecting scattered X-rays.

In a region where the incident angle θ_i is smaller than a critical angle θ_{c-f} of the insulator film, the X-rays undergo total reflection on the surface of the insulator film. As a result, no X-rays are able to enter the insulator film, making it difficult or impossible to achieve measurement. Moreover, in a case where the incident angle θ_i is larger than the critical angle θ_{c-f} but smaller

than a total-reflection critical angle θ_{c-s} of the substrate, the X-rays undergo total reflection once on the substrate. As a result, after the reflection, the components scattered by a pore Y are superimposed intensely, making it difficult to achieve measurement. If measurement cannot be achieved easily in a region where the scattering angle is small, determining distribution in a region where the pore size is larger may be difficult.

Rejections under 35 U.S.C. § 102

Houtman

Claims 1, 2 and 4 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,446,777 to Houtman. Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 1-2 and 4 have been cancelled, and so the rejection of these claims is now moot. The Applicants, therefore, respectfully request that the rejection to Claims 1-2 and 4 under 35 U.S.C. § 102(b) be withdrawn.

Mazor et al.

Claims 1, 3 and 8 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,556,652 to Mazor et al. Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 1, 3 and 8 have been cancelled, and so the rejection of these claims is now moot. The Applicants, therefore, respectfully request that the rejection to Claims 1, 3 and 8 under 35 U.S.C. § 102(e) be withdrawn.

Koppel

Claims 1, 5 and 7 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,619,548 to Koppel. Applicants respectfully traverse this rejection for the reasons detailed below.

Claims 1, 5 and 7 have been cancelled, and therefore, the rejection of these claims is now moot. The Applicants, therefore, respectfully request that the rejection to Claims 1, 5 and 7 under 35 U.S.C. § 102(b) be withdrawn.

Koppel et al.

Claims 9 and 13 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,507,634 to Koppel et al. Applicants respectfully traverse this rejection for the reasons detailed below.

With regards to claim 9, the Examiner states that Koppel et al. discloses a method comprising irradiating the insulator film with X-rays from the insulator film's surface side at an incident angle which is set to be larger than a total-reflection critical angle of the insulator film but less than 1.3 times a total-reflection critical angle of the substrate, and necessarily detecting among reflection components reflected on the surface of the substrate of the X-rays which have entered the insulator film, reflection components exiting from the insulator film after entering the pore or particle and scattering, having an exit angle larger than that of reflection components which exit from the insulator film without entering the pore or particle. Applicants respectfully disagree.

Applicants respectfully submit that the Examiner does not point out (nor can Applicants find) where Koppel teaches or suggests “irradiating the insulator film with X-rays from the insulator film’s surface side at an incident angle which is set to be larger than a total-reflection critical angle of the insulator film, **but less than 1.3 times a total-reflection critical angle** of the substrate” as recited in claim 9.

The Applicants, therefore, respectfully request that the rejection to Claim 9 under 35 U.S.C. § 102(b) be withdrawn. Claim 13, dependent on independent claim 9, is patentable for the reasons stated above with respect to claim 1 as well as for its own merits. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection to independent claim 9 and all claims dependent thereon.

Rejections under 35 U.S.C. § 103

Koppel in view of Houtman

Claim 10 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Koppel in view of Houtman. Applicants respectfully traverse this rejection for the reasons detailed below.

With respect to claim 10, Applicants incorporate the discussion presented above with respect to the deficiencies of Koppel to teach or suggest the pore or particle-size distribution measurement method as recited in claim 9. As claim 10 depends from claim 9, Applicants submit that claim 10 is

equally allowable over the applied references. The Applicants, therefore, respectfully request that the rejection to Claim 10 under 35 U.S.C. § 103(a) be withdrawn.

Koppel in view of Mazor et al.

Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Koppel in view of Mazor et al. Applicants respectfully traverse this rejection for the reasons detailed below.

With respect to claim 11, Applicants incorporate the discussion presented above with respect to the deficiencies of Koppel to teach or suggest the pore or particle-size distribution measurement method as recited in claim 9. As claim 11 depends from claim 9, Applicants submit that claim 11 is equally allowable over the applied references. The Applicants, therefore, respectfully request that the rejection to Claim 11 under 35 U.S.C. § 103(a) be withdrawn.

Koppel et al. in view of Yokhin

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Koppel et al. in view of Yokhin. Applicants respectfully traverse this rejection for the reasons detailed below.

With respect to claim 14, Applicants incorporate the discussion presented above with respect to the deficiencies of Koppel to teach or suggest

the pore or particle-size distribution measurement method as recited in claim 9. As claim 14 depends from claim 9, Applicants submit that claim 14 is equally allowable over the applied references. The Applicants, therefore, respectfully request that the rejection to Claim 14 under 35 U.S.C. § 103(a) be withdrawn.

Koppel et al. in view of Koppel

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Koppel et al. in view of Koppel. Applicants respectfully traverse this rejection for the reasons detailed below.

With respect to claim 15, the Examiner stated that Koppel et al. discloses a method comprising the steps of irradiating X-rays generated by a focus X-ray source from the insulator film's surface side at an incident angle set to be larger than a total-reflection critical angle of an uppermost surface layer, and detecting scattered X-rays by a two-dimensional position-sensitive detector; that however, Koppel et al. fails to disclose a point source X-ray source; that Koppel teaches a point-source X-ray source; that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Koppel et al. with the source of Koppel, since one would have been motivated to make such a modification for decreasing the amount of time to measure a structure as implied from Koppel; and that furthermore, since the Examiner finds that the prior art contained a method which differed from the

claimed method by the substitution of one source for another, and since the Examiner finds that the substituted sources and their functions were known in the art, the Examiner thus finds that one of ordinary skill in the art could have substituted one known source for another, and the results of the substitution would have been predictable. Applicants respectfully disagree.

Applicants submit that the Examiner has made an inconsistent statement in suggesting that Koppel both does **and** does not disclose a point focus X-ray source. However, Applicants suggest that Koppel only teaches an X-ray source, and **not** “a point focus X-ray source” as recited in claim 15.

In addition to the above feature, the Examiner does not point out (nor can Applicants find) where Koppel teaches or suggests “irradiating X-rays generated by a point focus X-ray source from the insulator film’s surface side **at an incident angle set to be larger than a total-reflection critical angle** of an uppermost surface layer” as recited in claim 15.

The Applicants, therefore, respectfully request that the rejection to Claim 15 under 35 U.S.C. § 103(a) be withdrawn.

Allowable Subject Matter

Applicants thank the Examiner for indicating the allowable subject matter of claims 12 and 16. However, Applicants do not believe amending the claims is necessary for the reasons detailed above.

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley, Reg. No. 34,313, at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKY, & PIERCE, P.L.C.

By



Donald J. Daley, Reg. No. 34,313
P.O. Box 8910
Reston, Virginia 20195
(703) 668-8000

DJD/EGH:ljs